pedibus omnibus gracilibus, tibiis anticis fere æqualiter tridentatis, femoribus posticis paulo inflatis.
Long. 15·5 mm.

Hab. Brit. East Africa, Mombasa.

This is a considerably smaller insect than *D. delagoensis*, Brenske, and of broader, less convex form. Its pubescence also is less uniform, being short and inconspicuous upon the clypeus, elytra, and pygidium, and long and dense upon the vertex and pronotum, whereas in the type species it is short and velvety over the whole upper surface. The teeth of the anterior tibiæ are rather less strong in the new species, but the hind femora are rather bulbous, as in *D. delagoensis*. The antennæ are similar in both species, but the maxillary palpi of *D. crinitus* are rather longer and more slender than in the other.

A single male specimen was brought from the Rabbai Hills, Mombasa, by the Rev. W. W. Taylor.

XX.—*North-American Bees of the Genus* Andrena.

By T. D. A. Cockerell.

Andrena medionitens, sp. n.

♀.—Length 8–9½ millim.

Black; head ordinary, facial quadrangle nearly square; antennæ short, faintly brownish beneath, first joint of flagellum a little longer than the next two united; facial foveæ broad throughout, white, separated from the eyes by only a linear interval; sides of face, vertex, and occiput covered with fulvous hair (no black hair anywhere about head or thorax); clypeus shining, with rather close large punctures and a median impunctate line; process of labrum broad, concavely truncate; thorax rather densely covered with erect stiff fulvous hair, except the middle of mesothorax and scutellum, which are bare and shining; mesothorax where covered with hair dull and tessellate, with rather sparse shallow (but quite distinct) punctures; the shining part is also sparsely punctured; metathorax dull and roughened, the enclosure ill-defined and without any ridge or plicæ; tegulæ dark brownish; wings yellowish, faintly dusky at apex; stigma and nervures clear orange ferruginous; legs black, with pale fulvous hair; middle tarsi dark reddish; hind tibiæ and tarsi ferruginous, the former stained with black on the inner face;

hair on inner side of basal joint of hind tarsi pale fulvous; abdomen minutely tessellate, impunctate, with dense, broad, yellowish-white hair-bands on segments 2 to 4, that on 2 interrupted in the middle; caudal fimbria very pale chocolate-colour.

Hab. Pasco, Washington State, May 25, 1896 (*Trevor Kincaid*). Also from Colorado (*Gillette*, no. 2470).

The Colorado example is somewhat smaller and has the first joint of flagellum shorter, but it is surely the same species.

This species is to be compared with *A. trizonata* and *A. salicis*. From *trizonata* it may be separated by the shining middle of thorax and the colour of the legs and pubescence. From *salicis* it will be known by the dense white (not fulvous) hair-bands and the larger process of labrum.

Andrena semipunctata, sp. n.

♀.—Length 10 millim.

Black; head and thorax quite densely covered with erect, stiff, dull white hair, not at all tinged with ochraceous; head ordinary, facial quadrangle broader than long; flagellum brownish beneath, its first joint rather short; facial foveæ pale, separated by an appreciable interval from the eyes; clypeus very hairy all over and entirely covered (except a very short median smooth line) with large confluent punctures; lower edge of clypeus with two dark brown bristles pointed downwards; process of labrum rounded, subtruncate; mandibles reddish at apex; mesothorax dull, minutely roughened, with not very dense, irregular, large punctures; median and parapsidal grooves distinct; scutellum punctured, its anterior half shining; no black hair on thorax; enclosure of metathorax with radiating weak and mostly short ridges, apex of triangle cut off by a sharp transverse ridge; tegulæ dark brown; wings hyaline, faintly clouded apically, nervures and stigma (which is quite large) very dark brown, basal nervure somewhat curved; legs black, the small joints of the tarsi more or less reddish; hair on inner side of basal joint of hind tarsi white; abdomen with the basal portions of the segments (that of second to fourth raised) strongly but sparsely punctured, the remaining portions minutely tessellate and impunctate; apical lateral margins of the segments with dense white hair-patches, very small on the first, larger on each subsequent one, forming well-defined though medially interrupted bands on the third and fourth segments; caudal fimbria brownish sooty.

♂.—Length about 9 millim.

More slender, with slender legs; abdominal hair-bands less developed; face wholly black; flagellum only slightly brownish beneath.

Hab. Seattle, Washington State, April 5, 1896 (*Trevor Kincaid*).

Belongs to the group of *A. rugosa*. The abdomen is fashioned much as in *A. spiræana*. In *A. striatifrons* the raised basal portions of the abdominal segments are also punctured, but more closely than in *A. semipunctata*.

Andrena hartfordensis, sp. n.

♀.—Size, form, pubescence, wings, &c. as in *A. bipunctata*, but has the clypeus minutely tessellate and dull all over, with rather sparse shallow punctures; the facial foveæ broader above; the second submarginal cell broader above; and the mesothorax with distinct though shallow and rather sparse punctures. Process of labrum truncate.

It is extremely close to *A. nothoscordi*, but differs by the punctured mesothorax, the cheeks not bulging, the mandibles rufescent only at tips, the mesothorax dull all over, and the flagellum only faintly brown beneath.

The caudal fimbria is fulvous or greyish fulvous; the three white abdominal hair-bands are very narrow and entire; the wings are yellowish, with ferruginous stigma and nervures.

Hab. Hartford, Connecticut, May 31, 1896 (*S. N. Dunning*, no. 1026); Milwaukee, Wisconsin, May 28 (*Dr. S. Grœnicher*, no. 8).

According to Robertson the antennæ of *nothoscordi* are shorter than those of *bipunctata*; this is by no means the case in *hartfordensis*.

Andrena bipunctata, Cresson.

A new locality is Ithaca, N. Y., May 11, 1890 (*Macgillivray*).

Andrena kansensis, Ckll.

Gallinas River, at Las Valles, New Mexico; two males at flowers of plum, April 20, 1901. New to New Mexico.

At the same time and place, also on flowers of plum, were taken many examples of *Andrena prunorum*, Ckll. Las Valles is the place hitherto cited in my papers as "Gallinas River, at La Cueva"; I was misinformed regarding the name of the locality.

Andrena Porterœ, Ckll.

Gallinas River, at Las Valles, N. M.; females at flowers of *Ribes*, April 20, 1901.

Andrena carlini, Ckll.

Fort Collins, Colorado, June 11, 1899 (*Titus*). New to Colorado.

Andrena Grœnicheri, sp. n.

♀.—Length about 12 millim.

Black, with pale ochreous pubescence; head ordinary, cheeks rather swollen; flagellum brownish beneath, its first joint considerably longer than the next two together; clypeus nude except at sides, shining, with strong, rather sparse punctures, no median ridge; facial foveæ broad but short, yellowish white, very close to orbital margin; process of labrum low and rounded, slightly truncate at apex; mesothorax dull, granular, with barely visible shallow punctures; base of metathorax granular, with no transverse ridge; tegulæ light amber; wings milky-white, nervures and stigma dark ferruginous; stigma small, second submarginal cell very broad, third no broader above than second; legs with the middle and hind tarsi, small joints of all the tarsi, and apices of hind tibiæ ferruginous; abdomen impunctate, with thin hair-bands on the second and following segments; fimbria very pale fulvous, not copious.

Hab. Milwaukee, Wisconsin, Aug. 28 (*Dr. Sigmund Grœnicher*).

Closely related to *A. helianthi*, Rob., but a smaller insect, recognizable by its milky wings. Allied also to *A. nitidior*, Ckll. Robertson's description of *A. helianthi* suggests that he may have confused *Grœnicheri* with it; but the species I recognize as *helianthi* agrees with an authentic specimen received from Mr. Robertson.

I may also remark that in separating *A. kansensis* from *A. Cressoni* (Ent. News, 1899, p. 255) I treated as typical *Cressoni* a species represented by an authentic example from Mr. Robertson, though it is evident that he regarded the two insects as identical, and included both in his conception of *Cressoni* (see remark in Trans. Am. Ent. Soc. 1891, p. 49). It appears, moreover, that he considered the *kansensis* form as the more typical, though less common. I ought perhaps to transfer the name *Cressoni* to the *kansensis* form and rename the insect I held for *Cressoni*; but before doing this

it would be desirable to make further investigations as to the validity of the species and the identity of Robertson's actual type.

Andrena Kincaidii, Ckll.

Mr. Kincaid took a male at flowers of *Syringa* at Olympia, Wash., June 3.

Andrena parnassiæ, sp. n.

♀.—Length about 8 millim.

Black, with copious but thin hair, greyish white on sides and middle of face, occiput, pleura, metathorax, and front of mesothorax, black on clypeus, vertex, mesothorax (except front), scutellum, and postscutellum; head broad, cheeks large and shining; antennæ black, faintly brownish at tips beneath, first joint of flagellum a little longer than the next two together, apical joint polished and shining above, contrasting with the other joints, which are much duller; clypeus strongly punctured, with a narrow median smooth line; process of labrum very low and broad, gently curved; facial foveæ scarcely pallid, close to eyes; mesothorax dull, minutely tessellate, with small punctures; enclosure of metathorax dull, coarsely roughened basally, no transverse ridge; tegulæ piceous; wings smoky, nervures piceous, stigma brown margined with piceous; legs black, with pale hair, hair on inner side of basal joint of hind tarsi pale brownish; abdomen oval, shining, but microscopically tessellate and impunctate, lateral hind margins of segments 2 to 4 with white hair-bands, that on 4 nearly continuous in the middle line; fimbria silvery grey.

Hab. Milwaukee, Wisconsin, Sept. 14 (*Dr. S. Grænicher*).

Dr. Grænicher informs me that it is an oligotropic bee, collecting pollen exclusively from *Parnassia caroliniana*. He had himself surmised that it was undescribed.

Andrena Peckhami, sp. n.

♀.—Length about 8½ millim.

Similar to *A. parnassiæ*, but differing as follows:—Head not so broad; clypeus with thin pale hair at sides, but nude in the middle, with a broad, shining, impunctate space; maxillary palpi longer; process of labrum a little rounder and without a broad shining edge; basal joints of tarsi all broad (in *parnassiæ* basal joint of hind tarsus is narrow and of middle tarsus shorter than in *Peckhami*); first recurrent nervure joining second submarginal cell considerably beyond

its middle (in *parnassiæ* it joins it about its middle); fimbria dull grey, quite dark.

Hab. Milwaukee, Wisconsin, July 24 (*Dr. S. Grœnicher*).

Named after Mr. G. W. Peckham, in recognition of his work on the habits of Wisconsin Hymenoptera.

East Las Vegas, New Mexico, U.S.A.,
Dec. 13, 1901.

XXI.—*Investigations upon the Life-history of Salmon, and their Bearing on the Phenomena of Nuptial and Sexual Ornamentation and Development in the Animal Kingdom generally.* By G. E. H. Barrett-Hamilton, Capt. 5th Royal Irish Rifles.

The coloration of animals, and especially that part of it which seems to have a connexion with sex, presents us with many problems of deep interest, and has formed the basis of a number of speculations, some of them examples of the best efforts of our strongest zoological thinkers. Many of these theories are of great ingenuity and have marked real stepping-stones in the progress of our knowledge. For this reason it would be in the highest degree ungrateful to attempt their downfall. Nor, indeed, would such an assault prove likely to be successful, so firmly established at the present day are the main lines of thought dealing with animal coloration.

Yet field-naturalists must often have felt dissatisfaction at the insufficiency of all known theories and have yearned for the discovery of some law which, embracing all the phenomena in its grasp, would place before their minds a comprehensive view of the whole question. At least that has been my own experience. While perfectly ready to admit that if some colours are procryptic, others aposematic, æsthetic, or even useful for purposes of mimicry, I have felt my attention more and more attracted to many examples of coloration which are inexplicable with reference to any one of the above-stated uses. Why, for instance, are the fauces of many birds so brilliantly tinted as to throw into the shade the glory of their plumage?* Why are the yolks of the eggs of some birds richly red, often in correspondence with a similar painting of legs, bill, and fauces? Why do† both sexes of so many animals belonging to almost all branches of the

* *E. g.* Kittiwake Gull (*Rissa tridactyla*).
† *E. g.* Chough (*Pyrrhocorax graculus*).